WHAT IS CLAIMED IS:

1. A method of processing semiconductor substrates and reducing particle contamination during processing of the substrates, the method comprising steps of:

(a) placing at least one substrate on a substrate holder in an interior space of a vacuum processing chamber, the processing chamber including at least one non-oxide ceramic part having a surface exposed to the interior space, the surface having been shaped and treated to reduce particles thereon by a high intensity plasma conditioning treatment;

(b) processing the at least one substrate by supplying process gas to the processing chamber; and

(c) removing the at least one substrate from the processing chamber.

2. The method according to Claim 1, wherein the processing chamber includes a substantially planar antenna which energizes the process gas into a plasma state by supplying RF power to the antenna and the process gas comprising at least one fluorocarbon gases, the method further including conditioning the exposed surface by energizing the fluorocarbon gas into a plasma state and contacting the exposed surface with the plasma.

3. The method according to Claim 2, wherein the plasma comprises a high density plasma and the substrates are processed by etching an oxide layer on the substrates with the high density plasma while supplying an RF bias to the substrates.

4. The method according to Claim 1, wherein the ceramic part comprises a gas distribution plate supplying the process gas to the processing

chamber and the processing chamber includes a substantially planar coil which energizes the process gas into a plasma state by supplying RF power to the antenna, the method further including conditioning the exposed surface by adjusting pressure in the processing chamber to 200 to 500 mTorr, supplying the coil with 2000 to 2500 W of radio frequency power, and/or changing coil termination capacitance of the coil so as to move an area of higher intensity plasma across the gas distribution plate.

5. The method according to Claim 1, wherein the processing chamber comprises a single wafer plasma reactor, the method further comprising a step of conditioning the exposed surface of the ceramic part by sequentially treating no more than 50 wafers in the processing chamber while exposing the ceramic part to ion bombardment, the conditioning step being effective to lower particle counts measured by the particle counter to below 20 particles.

6. The method according to Claim 1, further comprising a step of manufacturing the ceramic part by machining a part made of carbon, silicon, silicon carbide, silicon nitride, boron nitride, boron carbide, aluminum nitride or titanium carbide.

7. The method according to Claim 1, further comprising a step of manufacturing the ceramic part by machining a part made of CVD SiC, sintered SiC, sintered SiC coated with CVD SiC, converted graphite, or porous SiC backfilled with Si.

8. The method according to Claim 1, further comprising sequential steps of installing the ceramic part in the processing chamber, conditioning the

ceramic part by processing a single batch of non-production wafers in the processing chamber, and processing production wafers in the processing chamber.

9. The method according to Claim 1, wherein the processing chamber comprises a plasma reactor, the method further comprising a step of conditioning the ceramic part after installation thereof in the processing chamber, the conditioning step comprising treating the exposed surface with a high density plasma while powering the ceramic part to increase ion bombardment thereof.

10. The method according to Claim 1, wherein the processing chamber comprises a plasma reactor, the method further comprising a step of conditioning the ceramic part after installation thereof in the processing chamber, the conditioning step comprising treating the exposed surface with a high density plasma generated by energizing a halogen gas into a plasma state.

11. The method according to Claim 1, wherein the processing chamber comprises a plasma reactor, the method further comprising a step of conditioning the ceramic part after installation thereof in the processing chamber, the conditioning step comprising treating the exposed surface with a high density plasma generated by energizing an inert gas into a plasma state.

12. The method according to Claim 1, wherein the processing chamber comprises a plasma reactor, the method further comprising a step of conditioning the ceramic part after installation thereof in the processing chamber, the conditioning step comprising treating the exposed surface with a high density plasma generated by energizing oxygen gas into a plasma state.

13. The method according to Claim 1, wherein the processing chamber comprises a plasma reactor and the ceramic part is a silicon carbide part, the method further comprising a step of conditioning the silicon carbide part after installation thereof in the processing chamber, the conditioning step comprising treating the exposed surface with a high density plasma generated by energizing a fluorine containing gas into a plasma state.

14. The method according to Claim 1, wherein the processing chamber comprises a plasma reactor, the method further comprising a step of conditioning the ceramic part after installation thereof in the processing chamber, the conditioning step comprising treating the exposed surface with a high density plasma while seasoning the processing chamber.

15. A method of plasma conditioning a shaped surface of a ceramic part of a semiconductor processing chamber, the method comprising treating the shaped surface to reduce particles thereon by contacting the shaped surface with a high intensity plasma.

16. The method according to Claim 15, wherein the ceramic part is conditioned in a processing chamber which includes a substantially planar antenna which energizes process gas into a plasma state by supplying RF power to the antenna and the process gas comprising at least one fluorocarbon gas, the plasma conditioning being carried out by energizing the fluorocarbon gas into a plasma state and contacting the shaped surface with the plasma.

17. The method according to Claim 16, the ceramic part is conditioned in a processing chamber which wherein a process gas is energized into a plasma state, the process gas comprising at least one fluorocarbon gas, the plasma

conditioning being carried out by energizing the fluorocarbon gas into a plasma state and contacting the shaped surface with the plasma.

18. The method according to Claim 15, wherein the ceramic part comprises a gas distribution plate mounted in a processing chamber which includes a substantially planar coil which energizes process gas into a plasma state by supplying RF power to the antenna, the plasma conditioning being carried out by contacting the shaped surface with a high density plasma while adjusting pressure in the processing chamber to 200 to 500 mTorr, supplying the coil with 2000 to 2500 W of radio frequency power, and/or changing coil termination capacitance of the coil so as to move an area of higher intensity plasma across the gas distribution plate.

19. The method according to Claim 18, wherein the processing chamber comprises a single wafer plasma reactor, the plasma conditioning being carried out while sequentially treating semiconductor substrates in the processing chamber.

20. The method according to Claim 15, wherein the ceramic part is made of carbon, silicon, silicon carbide, silicon nitride, boron nitride, boron carbide, aluminum nitride or titanium carbide.

21. The method according to Claim 15, wherein the ceramic part is made of CVD SiC, sintered SiC, sintered SiC coated with CVD SiC, converted graphite, or porous SiC backfilled with Si.

22. The method according to Claim 15, wherein the plasma conditioning is carried out in a plasma etch chamber.

23. The method according to Claim 15, wherein the ceramic part comprises a gas distribution plate mounted in a processing chamber, the processing chamber including an antenna arranged to pass RF energy through the gas distribution plate and into the interior of the processing chamber, the gas distribution plate having a resistivity high enough to allow RF energy to pass therethrough, the plasma conditioning being carried out by energizing process gas into a plasma state by the antenna which couples RF energy into the chamber through the gas distribution plate.

24. The method according to Claim 15, wherein the method further includes installing the ceramic part in a plasma reactor, the plasma conditioning comprising treating the shaped surface with a high density plasma while powering the ceramic part to increase ion bombardment thereof.

25. The method according to Claim 15, wherein the method further includes installing the ceramic part in a plasma reactor, the plasma conditioning comprising treating the shaped surface with a high density plasma generated by energizing a halogen gas into a plasma state.

26. The method according to Claim 15, wherein the method further includes installing the ceramic part in a plasma reactor, the plasma conditioning comprising treating the shaped surface with a high density plasma generated by energizing an inert gas into a plasma state.

27. The method according to Claim 15, wherein the method further includes installing the ceramic part in a plasma reactor, the plasma conditioning comprising treating the shaped surface with a high density plasma generated by energizing oxygen gas into a plasma state.

28. The method according to Claim 15, wherein the ceramic part is a silicon carbide part and the method further includes installing the silicon carbide part in a plasma reactor, the plasma conditioning comprising treating the shaped surface with a high density plasma generated by energizing a fluorine containing gas into a plasma state.

29. The method according to Claim 15, wherein the method further includes installing the ceramic part in a plasma reactor, the plasma conditioning comprising treating the shaped surface with a high density plasma while seasoning the reactor.

30. The ceramic part conditioned by the method according to Claim 15.